IBM Sustainability Program & Renewable Energy:
Accomplishments and Challenges

Jay M. Dietrich
Distinguished Engineer: Corporate Environmental Affairs

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Agenda

- **IBM: A Cognitive Solutions and Cloud Platform Company**
- **Climate Stewardship Goals and Objectives**
- **IBM Renewable Electricity Procurement**
- **Challenges to Procuring Renewable Electricity**
- **Thoughts on Improving Accessibility of Renewables**

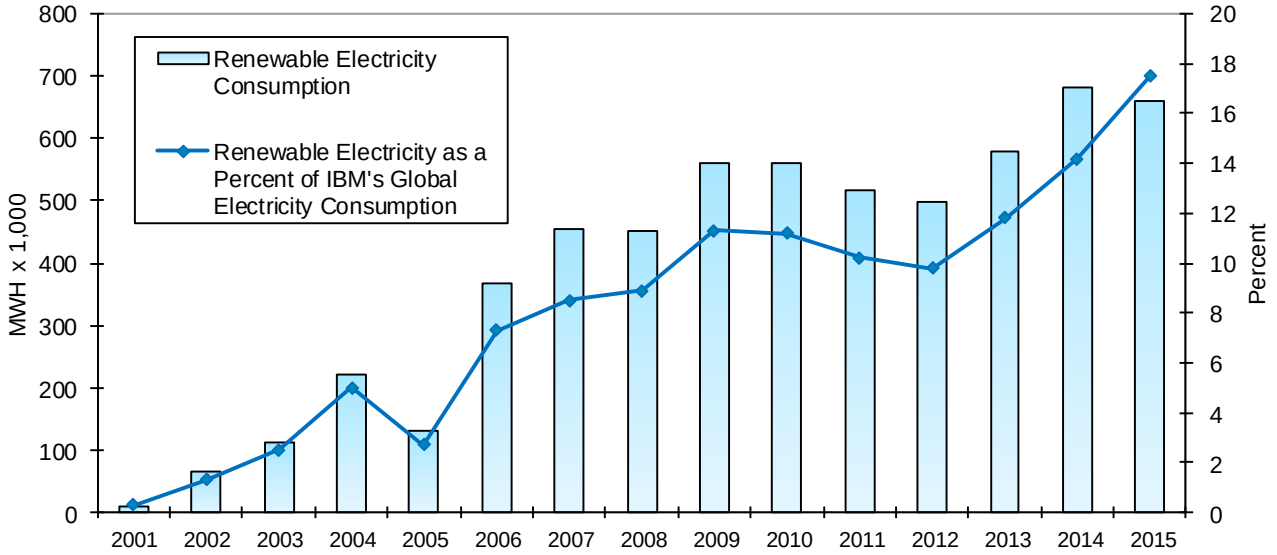
IBM's Energy and Climate Change Programs

- IBM's Energy and Climate program has been in place for over 2 decades

- Energy and Climate Operational Goals:
  - Reduce or avoid global energy consumption each year equal to 3.5% of IBM's current year consumption
    - Achieved 6.9% in 2015
  - Procure 20% of IBM's global electricity from renewable sources by 2020
    - Procured 660,000 MWH in 2015, 17.5% of global consumption
  - Reduce operational CO_2 emissions 35% by year-end 2020 against a 2005 baseline on a global basis
    - Reduced by over 28.7% in 2015 against the 2005 baseline.

Results: Procurement of Renewable Electricity

- Early and sustained leadership (measuring and disclosing results for 15 years)
- 2015 purchases (excluding divested semiconductor operations): 660,000 MWH or 17.5% of IBM's global electricity consumption (not including what routinely comes via grid power)
- To meet our 2020 goal, IBM will need to procure 800,000 MWH of renewable electricity
  - IBM facilities are in both regulated and unregulated markets.
  - Interested in developing an innovative approach for regulated markets.



CHALLENGES ASSOCIATED WITH THE PROCUREMENT OF RENEWABLE ELECTRICITY:

- Economically Matching Generation to Consumption is extremely difficult.

- Intermittent nature of solar and wind resources complicates procurement:
  - Direct Delivery of firm power to a location is costly, very difficult in unregulated markets.
  - Need to use Contract for Differences (CfDs), a financial instrument, to manage purchases.
  - Unbundled RECs do not integrate generation and consumption and are not a sustainable business strategy.

- In markets with renewable portfolio standards, Renewable Energy Certificates are too valuable to retire.
  - Consider creating matching generation and consumption RECs.

- Regulated Utilities could develop "firm" electricity packages with renewables:
  - Commercial rate class, could be offered in other rate classes.
  - Addresses the fact that renewables cannot provide 7x24 reliable supply.
  - Potentially creates new market to realistically drive renewables into the mix.
  - Needs innovation from utilities, cooperation from regulators and stakeholders.

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